atmosphere of the earth, is 1980 times more than that of the moon.—*We must conclude that so rare an atmosphere cannot cause any evaporation.*

Some of the lunar mountains are $1\frac{1}{4}$ miles high, and we can clearly perceive them with a telescope, which magnifies 100 times, and it is constantly observed, that the spots and inequalities of the superficies of the moon, are always seen in the same form, whence it follows, that there can be no cloud which covers even one mile in extent. Again, it has been observed that the edges of the moon emit more light than the centre, which is the very reverse of what happens in the sun, comets and planets, of which the centres are more luminous than the edges, on account of their being surrounded by atmospheres.

It has appeared to me, that the cause of the illumination of the moon, as noticed above, is the irradiation of the solar disk, and this observation may serve to give an idea of the extension of the luminous corona of the sun. Suppose then that there is no density in the lunar atmosphere.—By the preceding calculations, the apparent relative inclination of the orbits between the interior contacts was 4° 49′ 30″, the duration of the total obscurity 4′ 37″ and the relative apparent chord 1′ 48″ 16.

Moreover, the illumination preceded the emersion 6″ 8; we have therefore very nearly the irradiation of the semidiameter of the ☉ = $\frac{1' \ 48'' \ 16 \times 6'' \ 8}{4' \ 49'' \ 30} = 2'' \ 6.$

No. XLIV.

Observations on the solar eclipse of June 16th, 1806, made at Bowdoin College in the District of Maine. Communicated by a member of this Society to Mr. John Vaughan.

Read March 6th, 1807.

YOU ask for the result of the observations made at Bowdoin College, (in the township of Brunswick and district of

Maine,) on the subject of the solar eclipse, of June 16, 1806. I send it to you as I have received it from the respectable President of that institution, the Rev. Dr. M'Keen.

I shall begin by an extract from the letter of President M'Keen.

Brunswick, August 22d, 1806.

"DEAR SIR,

"On several days previous to the solar eclipse of June 16th, "I paid particular attention to my clock, and by a great num- "ber of double altitudes ascertained the rate of its going. Pro- "fessor Cleaveland and Mr. Parker observed with me.

"We rated the beginning of the eclipse at. . $10^h\ 14'\ 00''$
"the end . . . . . $12\ 55\ 20$ } Apparent time.

"As we had no micrometer fitted to either of of our tele- "scopes, we could not determine accurately, the quantity "eclipsed; but by receiving an image of the sun through a "reflecting telescope, upon a plane surface with twelve con- "centric circles drawn upon it, we were assured that it ex- "ceeded eleven digits. We did not find it easy to keep the "limb of the sun's disk long in perfect coincidence with the "arc of the greatest circle, and therefore could not measure it "with perfect accuracy. The Rev. Mr. Jenks, who assisted "me in this observation, thought it exceeded $11\frac{1}{3}$ digits; I "judged it to be somewhat less. It may be presumed there- "fore, that at the greatest obscuration, $11\frac{1}{3}$ digits, nearly, were "eclipsed.

"The latitude of the College is about 43° 53′ N; and its "longitude, as determined by an eclipse of the moon in Ja- "nuary, 1805, is 69° 50′ W. of Greenwich.

"Three or four stars, about the middle of the eclipse, were "easily seen with the naked eye.

"Professors Abbot and Cleaveland noted a series of observa- "tions of the thermometer, barometer and hygrometer of Du- "luc, during the eclipse. The barometer did not appear to "be at all affected by it; the mercury in the thermometer fell "6 degrees and rose again, and the hygrometer varied from

"59 to 57 and returned after the eclipse nearly to its former "position."

I shall now proceed to give you the supplementary remarks which have been furnished by Professor Cleaveland.

"Our large *reflecting telescope* has the magnifying power of "450. I used the shortest eye-glass and middle-sized specu- "lum, which, if I am correct, magnifies 360 times.

"The President used his own telescope, and left the ma- "nagement of the large one to myself.—Its magnifying pow- "er is so great, that fearing lest I should not discover the com- "mencement of the eclipse, I kept the telescope in a slow mo- "tion, ranging backwards and forwards in a small arc. The "telescope was probably at one extremity of this arc, while "the immersion actually took place, for at the moment when "it was actually discovered by the telescope belonging to the "equatorial, I moved my telescope, and found the shadow "must have been discoverable two seconds at least. I allowed "one second for the motion of the telescope, after the eclipse "was seen by the observer with the equatorial, and the time "of the commencement was noted one second back accord- "ingly. This perfectly agreed with the observation of the "emersion.—We had some one at the clock, counting seconds; "and the shadow was visible one second longer by the large "telescope, than by the other, which circumstance was con- "sidered confirmatory of the allowance of one second made at "the commencement." So far the college observations extend.

I do not recollect to have heard of any accurate astronomical observations, made in the United States to the north of Brunswick.

No. XLV.

On finding the longitude from the moon's meridian altitude, by William Dunbar of Natchez.

Read August 15th, 1806.

THE usual mode of making the lunar observation for the purpose of ascertaining the longitude, requires the aid of a